

S/N 10/774,956



PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Donald S. Gardner	Examiner:	Nema O. Berezny
Serial No.:	10/774,956	Group Art Unit:	2813
Filed:	February 09, 2004	Docket:	884.140US3
Title:	INDUCTORS FOR INTEGRATED CIRCUITS (As Amended)		
Assignee:	Intel Corporation	Customer Number:	21186

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**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicant respectfully requests that this Supplemental Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicant requests that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicant with the next official communication.

Pursuant to 37 C.F.R. §1.97(c)(2), Applicants have included the fee of \$180.00 as set forth in 37 C.F.R. §1.17(p). Please charge any additional fees or credit any overpayment to Deposit Account No. 19-0743.

09/16/2005 EAYALEW1 00000006 190743 10774956

02 FC:1806 180.00 DA

The Examiner is invited to contact the Applicant's Representative at the below-listed telephone number if there are any questions regarding this communication.

Pursuant to 37 C.F.R. 1.98(a)(2), Applicant believes that copies of cited U.S. Patents and Published Applications are no longer required to be provided to the Office. Notification of this change was provided in the United States Patent and Trademark Office OG Notices dated October 12, 2004. Thus, Applicant has not included copies of any US Patents or Published Applications cited with this submission. Should the Office require copies to be provided, Applicant respectfully requests that notice of such requirement be directed to Applicant's below-signed representative. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

Respectfully submitted,

DONALD S. GARDNER

By his Representatives,

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Date Sept. 12, 2005 By Ann M. McCrackin  
Ann M. McCrackin  
Reg. No. 42,858

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 12th day of September, 2005.

John D. Gustafson-Wrathell  
Name

John D. Gustafson-Wrathell  
Signature

Substitute for form 1449A/PTO

# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

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<b>Examiner Name</b>	Berezny, Nema

Sheet 1 of 4

Attorney Docket No: 884.140US3

## **US PATENT DOCUMENTS**

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
	US-3,607,462	09/21/1971	Laing, Alfred M.	03/21/1968
	US-3,905,883	09/16/1975	Hanazono, Masanobu , et al.	06/18/1974
	US-4,543,553	09/24/1985	Mandai, H. , et al.	05/16/1984
	US-4,791,719	12/20/1988	Kobayashi, Tetsuo , et al.	01/08/1987
	US-4,797,648	01/10/1989	Kaneko, Toshimi , et al.	03/09/1988
	US-4,816,784	03/28/1989	Rabjohn, Gordon G.	01/19/1988
	US-5,047,296	09/10/1991	Milttenberger, Bernard , et al.	09/08/1988
	US-5,121,852	06/16/1992	Wilkes, Robert D.	08/08/1991
	US-5,221,459	06/22/1993	Okano, Yoko , et al.	04/24/1992
	US-5,420,558	05/30/1995	Ito, Naoki , et al.	05/26/1993
	US-5,469,399	11/21/1995	Sato, Toshiro , et al.	03/15/1994
	US-5,530,415	06/25/1996	Takaya, Minoru	03/07/1994
	US-5,583,474	12/10/1996	Mizoguchi, Tetsuhiko , et al.	05/25/1994
	US-5,609,946	03/11/1997	Korman, Charles S., et al.	10/03/1995
	US-5,694,030	12/02/1997	Sato, Toshiro , et al.	09/16/1996
	US-5,705,287	01/06/1998	Doerner, Mary F., et al.	09/20/1994
	US-5,793,272	08/11/1998	Burghartz, J. N., et al.	08/23/1996
	US-5,834,825	11/10/1998	Imai, Kiyotaka	12/23/1996
	US-5,892,425	04/06/1999	Kuhn, W. B., et al.	04/10/1997
	US-5,961,746	10/05/1999	Nepela, Daniel A.	08/15/1997
	US-5,976,715	11/02/1999	Chen, Li-Han , et al.	11/06/1997
	US-6,031,445	02/29/2000	Marty, Michel , et al.	11/25/1998
	US-6,033,782	03/07/2000	Hubbard, Ronald N., et al.	05/21/1997
	US-6,067,002	05/23/2000	Fujino, Masato , et al.	09/11/1996
	US-6,103,136	08/15/2000	Han, Cherng-Chyi	03/23/1998
	US-6,121,852	09/19/2000	Mizoguchi, Tetsuhiko , et al.	07/14/1998
	US-6,166,422	12/26/2000	Qian, Linggian , et al.	05/13/1998
	US-6,191,495	02/20/2001	Kossives, Dean P., et al.	04/16/1999
	US-6,207,303	03/27/2001	Tomita, Hiroshi	06/02/1998
	US-6,404,317	06/11/2002	Misoguchi, Tetsuhiko , et al.	08/23/1996
	US-6,441,715	08/27/2002	Johnson, F. S.	02/16/2000
	US-6,452,243	09/17/2002	Hatano, Keisuke , et al.	12/20/1999

## **FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T <sup>2</sup>
	DE-4117878A1 (w/ English Abstract)	12/12/1991	Hasegawa, M , et al.	
	EP-0295028A1	12/14/1988	Pettigrew, Robert M., et al.	
	EP-0884783A2	12/16/1998	Kossives, Dean P., et al.	

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Substitute Disclosure Statement Form (PTO-1449)

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Substitute for form 1449A/PTO <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>	Complete if Known <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"><b>Application Number</b></td> <td>10/774,956</td> </tr> <tr> <td><b>Filing Date</b></td> <td>February 9, 2004</td> </tr> <tr> <td><b>First Named Inventor</b></td> <td>Gardner, Donald</td> </tr> <tr> <td><b>Group Art Unit</b></td> <td>2813</td> </tr> <tr> <td><b>Examiner Name</b></td> <td>Berezny, Nema</td> </tr> </table>	<b>Application Number</b>	10/774,956	<b>Filing Date</b>	February 9, 2004	<b>First Named Inventor</b>	Gardner, Donald	<b>Group Art Unit</b>	2813	<b>Examiner Name</b>	Berezny, Nema
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Sheet 2 of 4	Attorney Docket No: 884.140US3										

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Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T <sup>2</sup>
	JP-06124843 (w/ English Abstract)	05/06/1994	Mino, Masato, et al.	
	JP-61020311 (w/ English Abstract)	01/29/1986	Tago, Akio, et al.	
	WO-0139220A1	05/31/2001	Gardner, Donald	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		T <sup>2</sup>
		"Magnetic Devices Research", (various articles) <a href="http://mems.mirc.gatech.edu/research/magnetic.html">http://mems.mirc.gatech.edu/research/magnetic.html</a> , 10 pgs.		
		BABA, M., et al., "GHz-drive Magnetic Thin-Film Inductor Using CoNbZr film", <u>Journal of the Magnetics Society of Japan</u> , 24(4-2), (2000), 879-882		
		BRANDON, E., et al., "Microinductors for spacecraft power electronics", <u>Magnetic Materials, Processes and Device VI Applications to Storage and Microelectromechanical systems (MEMS)</u> , Vol. 2000-29, The Electrochemical Society, Inc., Pennington, New Jersey, (2001), 559-567		
		BRANDON, E., et al., "Passive Components for Systems-on-a-Chip Applications", <u>International Conference on Integrated Micro Nanotechnology for Space Applications</u> , Center for Integrated Space Microsystems, Jet Propulsion Laboratory, (April 11-15, 1999), 3 pgs.		
		BRANDON, E., "System on a Chip Integrated Passive Components ( $\mu$ IRS)", 2 pgs.		
		BURGHARTZ, J., "Integrated Multilayer RF Passives in Silicon Technology", <u>1998 Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems, Digest of Papers</u> , (Sept. 17-18, 1998), 141-147		
		BURGHARTZ, J. N., "Progress in RF Inductors on Silicon-Understanding substrate Losses", <u>Techn. Dig. IEDM</u> , (1998), 523-526		
		FESSANT, A., et al., "Influence of In-Plane Anisotropy and Eddy Currents on the Frequency Spectra of the Complex Permeability of Amorphous CoZr Thin Films", <u>IEEE Transactions on Magnetics</u> , 29(1), (January 1993), 82-87		
		GARDNER, D., et al., "High Frequency (GHz) and Low Resistance Integrated Inductors Using Magnetic Materials", <u>Proc. IEEE Int. Interconnect Technol. Conf.</u> , (June 2001), 101-103		
		GARDNER, D., et al., "Mechanical Stress as a Function of Temperature for Aluminum Alloy Films", <u>Journal of Applied Physics</u> , 67(4), (February 15, 1990), 1831-1845		
		KOBAYASHI, Y., et al., "New Type Micro Cloth-inductor and Transformer With Thin Amorphous Wires and Multi-Thin Coils", <u>IEEE Transactions on Magnetics</u> , 28(5), (September 1992), 3012-3014		

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Substitute for form 1449A/PTO

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Sheet 3 of 4

Attorney Docket No: 884.140US3

## **OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		KORENIVSKI, V., et al., "Magnetic Film Inductors for Radio Frequency Applications", <u>Journal of Applied Physics</u> , 82(10), (November 15, 1997), 5247-5254	
		LONG, J., et al., "The Modeling, Characterization, and Design of Monolithic Inductors for Silicon RF IC's", <u>IEEE Journal of Solid-State Circuits</u> , 32(2), (March 1997), 357-369	
		MATSUKI, H., et al., "A New Cloth Inductor Using Amorphous Fiber", <u>IEEE Transactions on Magnetics</u> , 21(5), (September 1985), 1738-1740	
		MOHAN, S., et al., "Bandwidth Extension in CMOS With Optimized On-Chip Inductors", <u>IEEE Journal of Solid-State Circuits</u> , 35(3), (March 2000), 346-355	
		MOHAN, S., et al., "Modeling and Characterization of On-Chip Transformers", 1998 International Electron Devices Meeting Technical Digest, Center for Integrated Systems, Stanford University, Stanford, CA, (Dec. 1998), 531-534	
		MOHAN, S., et al., "Simple Accurate Expressions for Planar Spiral Inductances", <u>IEEE Journal of Solid-State Circuits</u> , 34(10), (October 1999), 1419-1424	
		MOJARRADI, M., et al., "Power Management and Distribution for System on a Chip for Space Applications", <u>AIAA Conference</u> , Paper No. 284, (1999), 8 pgs.	
		NIKNEJAD, A., et al., "Analysis, Design, and Optimization of Spiral Inductors and Transformers Si RF IC's", <u>IEEE Journal of Solid-State Circuits</u> , 33(10), (October 1998), 1470-1481	
		O'DONNELL, T., et al., "Microtransformers and Inductors using Permalloy Thin Films", <u>Preparation, Properties, and Applications of Thin Ferromagnetic Films</u> , <a href="http://www.iemw.tuwien.ac.at/publication/workshop0600/ODonnell.html">http://www.iemw.tuwien.ac.at/publication/workshop0600/ODonnell.html</a> , (June 2000), 45-52	
		PARK, J., et al., "Batch-fabricated microinductors with electroplated magnetically anisotropic and laminated alloy cores", <u>IEEE Transactions on Magnetics</u> , 35(5), (September 1999), 4291-4300	
		SATO, T., et al., "New Applications of Nanocrystalline Fe(Co-Fe)-Hf-O Magnetic Films to Micromagnetic Devices", <u>Journal of Applied Physics</u> , 83(11), (June 1, 1998), 6658-6660	
		TOMITA, H., et al., "Oblique-Field Annealing Effect for In-Plane Magnetic Anisotropy of Soft Magnetic Co-Nb-Zr Thin Films", <u>IEEE Transactions on Magnetics</u> , 30(3), (May 1994), 1336-1339	
		YABUKAMI, S., et al., "Noise Analysis of a MHz-3 GHz Magnetic Thin Film Permeance Meter", <u>Journal of Applied Physics</u> , 85(8), (April 15, 1999), 5148-5150	
		YAMAGUCHI, M., et al., "1 GHz-Drive Magnetic Thin-Film Inductors for RF Integrated Circuits Using Micro-Patterned Granular Film", <u>Digest of INTERMAG 99. 1999 IEEE International Magnetics Conference, 1999</u> , (May 18-21, 1999), ED01, 1 pg.	

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		YAMAGUCHI, M., et al., "Magnetic Films for Planar Inductive Components and Devices", <u>Handbook of Thin Film Devices</u> , edited by M.H. Francombe, Vol. 4, <u>Magnetic Thin Film Devices</u> , (2000), 185-212	
		YAMAGUCHI, M. , et al., "Magnetic Thin-Film Inductor for RF Integrated Circuits", <u>Extended Abstracts of the 1999 International Conference on Solid-State Devices and Materials</u> , Tokyo, (1999), 580-581	
		YAMAGUCHI, M. , et al., "Microfabrication and Characteristics of Magnetic Thin-Film Inductors in the Ultra High Frequency Region", <u>Journal of Applied Physics</u> , 85(11), (June 1, 1999), 7919-1922	
		YUE, C., et al., "On-Chip Spiral Inductors With Patterned Ground Shields for Si-Based RF ICs", <u>IEEE Journal of Solid-State Circuits</u> , 33(5), (May 1998), 743-752	

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